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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/809,548	03/15/2001	Steven H. Reichman	RL-1970	5475

7590 12/29/2004
Allegheny Technologies Incorporated
1000 Six PPG Place
Pittsburgh, PA 15222

EXAMINER

JOHNSON, STEPHEN

ART UNIT	PAPER NUMBER
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3641

DATE MAILED: 12/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/809,548

Applicant(s)

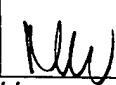
REICHMAN, STEVEN H.

Examiner

Stephen M. Johnson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-58 is/are pending in the application.
- 4a) Of the above claim(s) 12,14,24-44 and 47-54 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-11,15-23,45,46 and 55-58 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☒ Claim(s) 1,2 and 4-58 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1. Applicant's election without traverse of the armor or article containing an energy absorbing layer 22 of nickel-titanium alloy; an energy absorbing layer 24 of nickel-titanium alloy; a second plate 30 of alpha-beta titanium alloy; and a third plate of alpha-beta titanium alloy in Paper Nos. 11 and the Paper filed on 10/15/2004 is acknowledged.

Claim 3 is cancelled. Claims 12, 14, 24-44, and 47-54 are withdrawn from consideration as being directed to non-elected species. Claims 1-2, 4-11, 13, 15-23, 45-46, and 55-58 read on the elected invention and an action on these claims follows.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-2, 4-6, 10, 15, 17, 45, and 55-58 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsilevich.

Tsilevich discloses an armor comprising:

- | | |
|--|---------------------|
| a) a metallic material that undergoes a reversible | 22 or 37 |
| phase change; | |
| b) phase change at between -50°C and 200°C ; | col. 3, line 1 |
| c) a metallic material that is Nitinol; | col. 2, lines 52-53 |
| d) a second metallic plate; and | 34 (upper (fig. 3)) |
| e) a third metallic plate. | 34 (lower (fig. 3)) |

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4. Applicant's arguments are addressed as follows. It is argued that Tsilevich does not expressly or inherently teach an armor capable of withstanding penetration by a projectile. In response, Tsilevich does not explicitly teach a projectile encountering the armor of Tsilevich. However, the materials of Tsilevich, must inherently meet applicant's claim limitations. It makes no difference to the shape memory alloy strip (22 or 37) as to what causes the transition temperature to be reached (see col. 3, lines 1-3). Whether the cause is a cutting tool or an encountered projectile, the shape memory alloy will undergo a reversible phase change, as claimed, when the transition temperature is reached. It is argued that Tsilevich is directed to automatically applying a lateral compression force to a burglary tool and this is the case. However, it does not remove the fact that if a projectile encounters the shape memory alloy and the associated transition temperature is reached, the alloy strip 22 or 37 will undergo a reversible phase change. With regard to the claim limitation directed to "a metallic material that absorbs energy from an impacting projectile". Since both applicant's invention and Tsilevich use nickel-titanium alloys that have specific shape memory transition temperatures, the examiner can see no reason why this particular material would inherently perform in some fashion other than does applicant's shape memory alloy when encountering a projectile. Clearly the shape memory alloy material would absorb energy from a projectile just as applicant's does and undergo a reversible phase change. With regard to the argument that Tsilevich is directed to non-projectile burglary tools, this is accurate. However, it does not remove the fact that the materials of Tsilevich would inherently act just as applicant's materials if a projectile were encountered. Consequently, Tsilevich inherently meets the claim limitations of applicant since every claim element claimed by applicant is either explicitly or inherently met by Tsilevich.

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With regard to the argument that Tsilevich does not meet the claim limitation directed to a “plate”, note that either item 22 (a zigzag strip) or item 37 (see fig. 3) can be relied upon to meet this claim limitation. Webster defines the term “plate” as “a thin flat sheet or piece of metal or other material” (see attachment). Clearly items 22 and 37 meet this definition. It is further argued that Tsilevich does not “protecting an article of manufacturing against penetration”. In response, please see col. 1, lines 6-9, where Tsilevich expressly states his intention to protect against penetration.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-2, 4-6, 9-10, 15, 17, 45, and 55-58 are rejected under 35 U.S.C. 102(b) as being anticipated by Paine et al..

Paine et al. disclose an armor comprising:

- | | |
|--|---------------------|
| a) a metallic material that undergoes a reversible phase change; | col. 5, lines 7-35 |
| b) a second energy absorbing layer that exhibits an elastic strain deformation of at least 5%; | col. 3, lines 48-51 |
| c) phase change at between –50°C and 200°C; | inherent |
| c) a metallic material that is Nitinol; | col. 2, lines 52-53 |
| d) a second plate; and | see fig. 2 |
| e) a third plate. | see fig. 2 |

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7. Applicant's arguments are addressed as follows. It is argued that Paine et al. is directed to a polymeric composite material that includes fibers that exhibit a martensite phase transformation. In response, note layer 26 that is comprised of SMAC materials (col. 8, lines 10-11). Consequently, the material layer 26 is a material layer of shape memory alloy materials. Further, with regard to applicant's arguments that in one embodiment the plys consist of a polymeric composite material that includes metallic fiber reinforcement. In response, note that the metallic fiber reinforcement in this embodiment is Nitinol (a shape memory alloy) and that all that applicant has claimed is "at least one layer of a metallic material that absorbs energy from the impacting projectile and is selected from at least one of a metallic material that undergoes reversible phase change". As such, even the embodiment that contains embedded Nitinol fibers meets this claim limitation. It is further argued that this embodiment is composed primarily of polymeric material and only secondarily of a shape memory alloy. In response, the examiner notes that applicant has not claimed that the primary material must be a shape memory alloy. Therefore, Paine et al. meets applicant's claim limitations.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Paine et al. in view of Turner et al.

Paine et al. apply as previously recited. However, undisclosed is an armor article

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disposed on an armored vehicle. Turner et al. teach an armor article disposed on an armor vehicle, see entire disclosure. Applicant is selecting a particular use of the armor article of Paine et al. which is probably one of the most common uses of armor plates (see 89/36.08). It would have been obvious to a person of ordinary skill in this art at the time of the invention to apply the teachings of Turner et al. to the Paine et al. armor arrangement and have an armor arrangement that is disposed on an armored vehicle.

10. Applicant's arguments are addressed as follows. It is argued that all claim limitations must be taught by the prior art for a prima facie case of obviousness to apply. In response, Paine et al. teaches the armor as claimed in claim 45. Turner et al. teach the armored vehicle of claim 46. Therefore all claim limitations are taught and a prima facie case of obviousness is present.

11. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Paine et al. in view of Vecchio.

Paine et al. apply as previously recited. However, undisclosed is diffusion bonding to hold together adjacent layers. Vecchio teaches diffusion bonding to hold together adjacent layers, col. 19, lines 38-43. Applicant is selecting a known method for holding together adjacent armor layers and putting it to use as it is already commonly used in this art. It would have been obvious to a person of ordinary skill in this art at the time of the invention to apply the teachings of Vecchio to the Paine et al. armor arrangement and have an armor arrangement wherein the adjacent layers are joined in a way commonly known in this art.

12. Applicant's arguments are addressed as follows. It is argued that since Paine et al. does not recite all of the claim limitations of claim 1 a prima facie case of obviousness is not present. In response, please note paragraph 7 above to address this issue.

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13. Claims 11 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsilevich in view of Dobbs.

Tsilevich applies as previously recited. However, undisclosed are metallic materials for the outer layers that are alpha-beta titanium alloys. Dobbs teaches metallic materials for the outer layers that are alpha-beta titanium alloys (see claims 3 and 4). Applicant is substituting one well known metallic armor element for another in an analogous art setting. It would have been obvious to a person of ordinary skill in this art at the time of the invention to apply the teachings of Dobbs to the Tsilevich armor arrangement and have an armor arrangement with a different type of metallic material for the outer layers.

14. Applicant's arguments are addressed as follows. Applicant argues that a prima facie case of obviousness has not been met because Tsilevich does not meet all of the claim limitations of claim 1 from which claims 11 and 18 depend. In response, please note paragraph 4 above for a full explanation of how Tsilevich meets the claim limitations of claim 1.

15. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsilevich in view of Jackson et al. or Buehler et al..

Tsilevich applies as previously recited. However, undisclosed is a Nitinol shape memory alloy that is 55-Nitinol. Jackson et al. and Buehler et al. each teach the use of a Nitinol shape memory alloy (see entire disclosures). Applicant is substituting one Nitinol shape memory alloy for another. It would have been obvious to a person of ordinary skill in this art at the time of the invention to apply the teachings of Jackson et al. or Buehler et al. to the Tsilevich armor and have an armor that uses a different type of Nitinol shape memory alloy.

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16. Applicant's arguments are addressed as follows. Applicant argues that a prima facie case of obviousness has not be met because Tsilevich does not meet all of the claim limitation of claim 1 from which claims 7-8 depend. In response, please note paragraph 4 above for a full explanation of how Tsilevich meets the claim limitations of claim 1.

17. Claims 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsilevich in view of either Jackson et al. or Buehler et al. as applied to claims 1-2, 4-8 10, 15, 17, 45, 47-54 above, and further in view of Dobbs.

Tsilevich, Jackson et al., and Buehler et al. apply as previously recited. However, undisclosed are metallic materials for the outer layers that are alpha-beta titanium alloys. Dobbs teaches metallic materials for the outer layers that are alpha-beta titanium alloys (see claims 3 and 4). Applicant is substituting one well known metallic armor element for another in an analogous art setting. It would have been obvious to a person of ordinary skill in this art at the time of the invention to apply the teachings of Dobbs to the Tsilevich in view of either Jackson et al. or Buehler et al. armor arrangement and have an armor arrangement with a different type of metallic material for the outer layers.

18. Applicant's arguments are addressed as follows. Applicant argues that a prima facie case of obviousness has not be met because Tsilevich does not meet all of the claim limitation of claim 1 from which claims 19-23 depend. In response, please note paragraph 4 above for a full explanation of how Tsilevich meets the claim limitations of claim 1.

19. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paine et al. in view of Jackson et al. or Buehler et al..

Paine et al. apply as previously recited. However, undisclosed is a Nitinol shape

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memory alloy that is 55-Nitinol. Jackson et al. and Buehler et al. each teach the use of a Nitinol shape memory alloy (see entire disclosures). Applicant is substituting one Nitinol shape memory alloy for another. It would have been obvious to a person of ordinary skill in this art at the time of the invention to apply the teachings of Jackson et al. or Buehler et al. to the Paine et al. armor and have an armor that uses a different type of Nitinol shape memory alloy.

20. Applicant's arguments are addressed as follows. Applicant argues that a prima facie case of obviousness has not been met because Paine et al. does not meet all of the claim limitations of claim 1 from which claims 7-8 depend. In response, please note paragraph 7 above for a full explanation of how Paine et al. meets the claim limitations of claims 1.

21. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

22. Applicant's arguments filed on 6/07/2004 have been fully considered but they are not persuasive. These arguments have been addressed in the preceding paragraphs of this Office action.

23. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37